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$$\begin{aligned} (13) \quad R &= 40 \Omega \\ I &= 6.0 A \\ V &= ? \end{aligned}$$

$$\begin{aligned} V &= IR \\ &= 6.0(40) \\ &= 240 V \end{aligned}$$

$$\begin{aligned} (14) \quad V &= 120 V \\ I &= 0.75 A \end{aligned}$$

$$a) R = ?$$

$$R = \frac{V}{I} = \frac{120}{0.75} = 160$$

$$b) \text{ Radio light}$$

$$\frac{160}{8} = 20 \Omega$$

$$\begin{aligned} c) V_1 &= IR_1 \\ &= 0.75(20 \Omega) \\ &= 15 V \end{aligned}$$

$$\begin{aligned} (15) \quad R &= ? \quad a) R = \frac{V}{I} = \frac{120}{6.0} = 20 \Omega \quad b) R_{eq} = \frac{120}{4.0 A} \\ V &= 120 \\ I &= 6.0 A \end{aligned}$$

$$= 30 \Omega$$

$$R_{eq} = R_1 + R_2$$

$$30 \Omega = 20 + R_2$$

$$R_2 = 10 \Omega$$

$$\begin{aligned} (16) a) \quad 90 \Omega \\ c) \quad 12 \Omega \end{aligned}$$

$$b) 2.5 \Omega$$

$$\begin{aligned} (17) \quad R_{eq} &= ? \\ V_0 &= 120 V \\ I_0 &= 6.0 A \end{aligned}$$

$$R_{eq} = \frac{120}{6} = 20 \Omega$$

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} \dots$$

$$\frac{1}{20} = \frac{x}{160 \Omega}$$

$$x = 8$$

$$\begin{aligned} (18) \quad V &= 6.0 V \\ I &= 3.0 A \end{aligned}$$

$$R_1 = \frac{V}{I} = \frac{6}{3} = 2.0 \Omega$$

$$R_{eq} = \frac{6}{2} = 3.0 \Omega$$

$$R_{eq} = R_1 + R_2$$

$$3 = 2 + R_2$$

$$R_2 = 1.0 \Omega$$

$$\begin{aligned} (19) \quad V &= 6.0 V \\ I &= 0.250 A \end{aligned}$$

$$R_{radio} = \frac{6}{0.25} = 24 \Omega \quad R_{eq} = \frac{10}{0.25} = 40 \Omega$$

$$40 = 24 + R_2$$

$$R_2 = 16 \Omega$$

(3)

$$(20) \quad I_3 = 0.4A = I_0 = I_1 = I_2$$

a)

$$R_2 = \frac{V_2}{I_2} = \frac{4V}{0.4} = 10\Omega$$

$$R_3 = ?$$

$$R_{eq} = \frac{V_0}{I_0} = \frac{12}{0.4} = 30\Omega$$

$$R_{eq} = R_1 + R_2 + R_3$$

$$30\Omega = 8\Omega + 10\Omega + R_3$$

$$\boxed{R_3 = 12\Omega}$$

$$V_3 = I_3 R_3$$

$$= 0.4(12)$$

$$= \cancel{3.2} 4.8V$$

b) ~~224~~

$$I_0 = I_1 + I_2$$

$$6 = 2 + I_2$$

$$I_2 = 4$$

$$V_2 = I_2 R_2$$

$$= 4(9\Omega)$$

$$= 36V$$

$$V_0 = V_1 = V_2$$

$$\boxed{V_0 = 36V}$$

$$R_1 = \frac{V_1}{I_1} = \frac{36V}{2A} = \boxed{18\Omega}$$

$$\frac{1}{R_{Total}} = \frac{1}{18} + \frac{1}{9}$$

$$R_{Total} = \frac{18}{3} = 6\Omega$$

$$c) \quad R_{Total} = \frac{V_0}{I_0} = \frac{120}{6} = 20\Omega$$

$$R_{Total} = R_{P1} + R_3 + R_{P2}$$

$$\frac{1}{R_{P1}} = \frac{1}{60} + \frac{1}{12}$$

$$R_{P1} = 10\Omega$$

$$\frac{1}{R_{P2}} = \frac{1}{11} + \frac{1}{22} + \frac{1}{33}$$

$$R_{P2} = 6\Omega$$

$$R_{Total} = 10 + R_3 + 6$$

$$R_3 = 20 - 10 - 6$$

$$\boxed{R_3 = 4\Omega}$$

$$V_{P1} = I_0 R_{P1}$$

$$= 6A(10\Omega)$$

$$= 60V = R_1 = R_2$$

$$I_1 = \frac{V_1}{R_1} = \frac{60}{60} = \boxed{1A}$$

$$I_2 = \frac{V_2}{R_2} = \frac{60}{12} = \boxed{5A}$$

$$V_{P2} = I_0 R_{P2}$$

$$= 6A(6)$$

$$= 36V$$

$$I_4 = \frac{36}{11} = 3.3A$$

$$I_5 = \frac{36}{22} = 1.6A$$

$$I_6 = \frac{36}{33} = 1.1A$$